

## REMARKS/ARGUMENTS

Claims 1-34 were previously pending in the application. Claims 8 and 31 are canceled; claims 1-2, 4, 9, 11-12, 14-17, 20, 25-26, 29-30, and 32 are amended; and new claims 35-36 are added herein. Assuming the entry of this amendment, claims 1-7, 9-30, and 32-36 are now pending in the application. The Applicant hereby requests further examination and reconsideration of the application in view of the foregoing amendments and these remarks.

### Miscellaneous Amendments

The original claims have been amended to remove the exemplary figure reference labels. None of these amendments have been made to overcome any prior-art rejections.

### Objections to Claims 16-17

On page 2 of the office action, the Examiner objected to claims 16-17 "because they are duplicates of claims 14-15." In response, the Applicant submits that currently amended claim 16 depends from claim 1, while currently amended claim 14 depends from currently amended claim 12, which itself depends from claim 1. Since claim 14 implicitly includes the recitations of claim 12, while claim 16 does not, the Applicant submits that claim 16 is not a duplicate of claim 14. Similarly, since currently amended claim 17 depends from claim 16 and since currently amended claim 15 depends from claim 14, the Applicant submits that claim 17 is not a duplicate of claim 15. As such, the Applicant respectfully submits that the Examiner's objection to claims 16-17 was improper and should be removed.

### Rejections under 35 U.S.C. 112, Second Paragraph

On page 2, the Examiner also rejected claims 1-34 under 35 U.S.C. 112, second paragraph, as being indefinite.

Regarding claims 1 and 8, in addition to amending claim 1 to recite the features of previously pending, now canceled claim 8, the Applicant has amended claim 1 to explicitly recite that:

- o the resistor is connected to the oscillator;
  - o the sensing-and-canceling circuitry is connected to the damping capacitor and to the matching capacitor;
  - o the first reference voltage is applied to an input of the sensing-and-canceling circuitry;
- and
- o the transconductor capacitor is connected to the oscillator.

The Applicant submits that these amendments overcome the Examiner's indefiniteness rejections of claims 1 and 8.

Claim 2 has been amended to recite that (1) the first side of the resistor is connected to the damping capacitor at the first node and (2) the first control signal is generated based on a second voltage at the second side of the resistor, to clarify that the voltage recited in claim 2 is different from the voltage recited in claim 1. Claim 12 has been amended to recite "the voltage at the first node" to clarify that the voltage recited in claim 12 is the same as the voltage recited in claim 1. The Applicant submits that these amendments overcome the Examiner's indefiniteness rejections of claims 2 and 12.

Regarding claim 3, the Examiner stated that "it is unclear how the oscillator can 'use' the first control signal." Regarding claims 11 and 24, the Examiner stated that "it is unclear how the oscillator

can 'use' the second control signal to set the center frequency and how the frequency can be set because oscillator cannot set its frequency by itself. The same is true for claim 24." The Applicant does not fully understand the Examiner's rejections. In the exemplary embodiment shown in Fig. 7, the oscillator is a voltage-controlled oscillator (VCO), which receives two control signals  $V_{CTRL}$  and  $V_{BG}$ . As described in the Description of the Related Art on page 1 of the specification with reference to prior-art Fig. 1, a VCO is a device that generates a periodic output signal ( $F_{OUT}$  in Fig. 1), whose frequency is a function of the VCO input voltages  $V_{CTRL}$  and  $V_{BG}$ , where the high-gain input voltage  $V_{BG}$  is used to set the center frequency during calibration and the low-gain input voltage  $V_{CTRL}$  serves as the steady-state signal path. The Applicant submits that those skilled in the art would fully understand how the oscillator of claim 1 can use the first control signal for steady-state control of the synthesizer, as recited in claim 3. The Applicant submits further that those skilled in the art would fully understand how the oscillators of claims 1 and 20 can use the second control signal to set a center frequency for the oscillator, as recited in claims 11 and 24. If necessary, the Applicant would be happy to provide an affidavit in support of these statements. The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejections of claims 3, 11, and 24.

Regarding claim 4, the Examiner stated that "it is unclear how the transistor' on lines 5 and 7 can 'apply' output signal to the capacitor since the transistor is not the applying means." Here, too, the Applicant does not fully understand the Examiner's rejection. As shown in the exemplary embodiment of Fig. 5, first transistor 504 is connected to matching capacitor C1' such that the current generated by transistor 504 (i.e., the first transistor output signal of claim 4) is applied to matching capacitor C1'. Similarly, second transistor 506 is connected to damping capacitor C1 such that the current generated by transistor 506 (i.e., the second transistor output signal of claim 4) is applied to damping capacitor C1. Thus, first transistor 504 is "the applying means" for matching capacitor C1', and second transistor 506 is "the applying means" for damping capacitor C1. The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejection of claim 4.

Regarding claim 5, the Examiner stated that "the recitation 'the gate oxide thickness' lack clear antecedent basis. It is unclear how the capacitor can have the gate oxide thickness." First of all, claim 5 does not recite "the gate oxide thickness"; claim 5 recites "gate oxide thickness." As such, there is no antecedent basis problem with claim 5. Furthermore, on page 6, the Examiner stated (1) that Smith teaches transistors "connected to function as capacitor" and (2) that "the capacitance value of the transistor capacitors are determined by the gate oxide thickness of the transistor." Apparently, it is not unclear to the Examiner "how the capacitor can have the gate oxide thickness." The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejection of claim 5.

Regarding claims 6, 10, 23, and 34, the Examiner stated that "the recitation 'wherein the gate oxide thickness of the damping capacitor is about 17 Angstroms or less' is misdescriptive because it is inconsistent with what is recited in claim 5. For example, claim has already recited that the thickness is about 50 Angstroms. The same is true of claims 10, 23 and 34." Claim 5 does not recite that the gate oxide thickness is "about 50 Angstroms"; rather, claim 5 recites that the gate oxide thickness is "substantially less than about 50 Angstroms." Since the phrase "about 17 Angstroms or less" is not inconsistent with the phrase "substantially less than about 50 Angstroms," the recitation in claim 6 is not misdescriptive. The same arguments apply to claims 10, 23, and 34. The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejections of claims 6, 10, 23, and 34.

Regarding claim 7, the Examiner stated that "it is unclear how the circuitry can recognize the capacitance ratio in order to generate the second current." Claim 7 does not recite that the sensing-and-canceling circuitry "recognizes" the capacitance ratio. Rather, claim 7 recites that "the sensing-and-canceling circuitry is adapted to generate the second current as a scaled version of the first current based

on a capacitance ratio between the damping capacitor and the matching capacitor." Typically, in "recognition" of the capacitance ratio between the damping capacitor and the matching capacitor, the designer of the sensing-and-canceling circuitry selects components for that circuitry that will achieve the functionality recited in claim 7 (e.g., selecting transistors 504 and 506 with appropriate relative sizes in the exemplary embodiment of Fig. 5). The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejection of claim 7.

Claim 12 has been amended to explicitly recite that the second reference voltage is applied to an input of the gm cell. The Applicant submits that this amendment overcomes the Examiner's indefiniteness rejection of claim 12.

Regarding claims 14 and 20, the Examiner stated that "it is not understood how 'digital gm path' can accumulate the differences and generate a second gm output signal since the path is only a conducting means. The same is true for claim 20." Here, too, the Applicant does not fully understand the Examiner's rejection. In particular, the Applicant does not understand how or why the Examiner concluded that the digital gm path is "only a conducting means." As recited in claim 15 and as shown in the exemplary embodiment of Fig. 7, comparator 702, accumulator 704, and converter 706 form an example of the digital gm path of claim 14, where comparator 702 and accumulator 704 function together to "accumulate the differences," and converter 706 functions to "generate a second gm output signal." The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejections of claims 14 and 20.

Claim 29 has been amended to explicitly recite that the transconductor capacitor is connected to the oscillator to contribute to the generation of the first control signal for the oscillator. The Applicant submits that this amendment overcomes the Examiner's indefiniteness rejection of claim 29.

Regarding claims 30 and 31, the Examiner stated that "the recitation 'leakage current' on line 8 is confusing because it is unclear if this is additional 'leakage current' or further recitation of the previously claimed 'leakage current' on line 8 of claim 29. The same is true for claim 31." According to current amended claim 29, the first gm output signal is applied to the transconductor capacitor to compensate for leakage current in the transconductor capacitor. According to currently amended claim 30, the second current is applied to the damping capacitor to compensate for leakage current in the damping capacitor. The Applicant submits that it is clear that the leakage current recited in currently amended claim 30 is different from the leakage current recited in currently amended claim 29. Claim 31 has been canceled. The Applicant submits that this explanation overcomes the Examiner's indefiniteness rejections of claims 30 and 31.

None of these amendments have been made to overcome any prior-art rejections.

In view of the foregoing, the Applicant submits therefore that the rejections of claims under Section 112, second paragraph, have been overcome.

#### Prior-Art Rejections

On page 4, the Examiner rejected claims 1, 3-4, and 29-30 under 35 U.S.C. 102(e) as being anticipated by Frans. On page 5, the Examiner rejected claim 29 under 35 U.S.C. 102(b) as being anticipated by Fiedler. On page 5, the Examiner also rejected claims 2, 5-7, and 33-34 under 35 U.S.C. 103(a) as being unpatentable over Frans in view of Fiedler and further in view of Smith. On page 7, the Examiner rejected claims 33-34 under 35 U.S.C. 103(a) as being unpatentable over Fiedler and in view of Smith. On page 7, the Examiner also stated that claims 20-28 would be allowable if rewritten or

amended to overcome the rejections under Section 112, second paragraph. On page 8, the Examiner indicated that claims 8-19 and 31-32 would be allowable if rewritten to overcome the rejections under Section 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims. For the following reasons, the Applicant submits that all of the now-pending claims are allowable over the cited references.

Claim 1 has been amended to include the features of previously pending claim 8. As such, currently amended claim 1 is equivalent to previously pending claim 8 rewritten in independent form. Since the Examiner stated that previously pending claim 8 would be allowable if rewritten in independent form, the Applicant submits that currently amended claim 1 is allowable. Since claims 2-7 and 9-19 depend variously from currently amended claim 1, it is further submitted that those claims are also allowable.

Claim 20 has been amended to overcome the rejections under Section 112, second paragraph. Since the Examiner stated that previously pending claim 8 would be allowable if amended to overcome the rejections under Section 112, second paragraph, the Applicant submits that currently amended claim 20 is allowable. Since claims 21-28 depend variously from claim 20, it is further submitted that those claims are also allowable.

Claim 29 has been amended to include the features explicitly recited in previously pending claim 31. For the same reasons that the Examiner stated that previously pending claim 31 was allowable, the Applicant submits that currently amended claim 29 is allowable. Since claims 30 and 32-34 depend variously from claim 29, it is further submitted that those claims are also allowable.

#### New Claim 35

New claim 35 is similar to original claim 1 with the further recitation that the first reference voltage is different from the first control signal. For example, in the exemplary embodiment of Fig. 5, the first reference voltage  $V_{REF}$  is different from the first control signal  $V_{CTRL}$ .

In rejecting original claim 1, the Examiner indicated that V3 in Frans is an example of the first reference voltage of original claim 1. Significantly, however, as shown in Fig. 4 of Frans, V3 is both an input to op-amp 60 as well as the control signal applied to VCO 42. Thus, assuming that V3 is an example of the first reference voltage of original claim 1 (which the Applicant does not necessarily admit) and that V3 is also an example of the first control signal of original claim 1, Frans clearly teaches that the first reference voltage is the same as the first control signal. Since new claim 35 explicitly recites that the first reference voltage is different from the first control signal, the Applicant submits that new claim 35 is not anticipated by Frans.

None of the other cited references teaches or even suggests the features of new claim 35 that are missing from Frans.

As such, the Applicant submits that new claim 35 is allowable over the cited references.

#### New Claim 36

New claim 36 is similar to original claim 1 with the further recitations that (1) the resistor is connected between the damping capacitor and the oscillator (Feature (1)) and (2) the second current is applied at the first node (Feature (2)), where original claim 1 already recited that the damping capacitor is connected at the first node to the resistor. For example, in the exemplary embodiment of Fig. 5,

transistor 506 is connected at the first node to damping capacitor C1, where (1) resistor R1 is connected between damping capacitor C1 and the VCO (indicated in Fig. 5 by  $V_{CTRL}$ ) and (2) the current from transistor 506 is applied at the first node.

In rejecting original claim 2, the Examiner admitted that Frans "does not disclose a resistor coupled between the damping capacitor and the oscillator." Frans fails to teach Feature (1) of new claim 36.

Instead, the Examiner cited Fiedler as teaching, in Fig. 2, "a resistor (R1) coupled between the capacitor (C1) and the VCO (16)." Significantly, however, in Fig. 2 of Fiedler, there is no current applied to the node between capacitor C1 and resistor R1. As such, Fiedler fails to teach Feature (2) of new claim 36.

The Applicant submits further that there is no suggestion in the prior art for modifying the circuits taught in either Frans or Fiedler to provide a circuit that has both Feature (1) and Feature (2) of new claim 36. The Applicant submits further that it would be improper simply to assert that "it would be obvious to combine Feature (1) as taught in Fiedler with Feature (2) as taught in Frans," without any teaching in the prior art for doing so, especially in the world of electronics where such modifications can destroy the functionality of the original circuit.


For all these reasons, the Applicant submits that new claim 36 is neither anticipated by nor obvious in view of Frans and Fiedler, whether considered alone or in combination. Nor does Smith provide the teachings missing from Frans and Fiedler.

As such, the Applicant submits that new claim 36 is allowable over the cited references.

In view of the above amendments and remarks, the Applicant believes that the now-pending claims are in condition for allowance. Therefore, the Applicant believes that the entire application is now in condition for allowance, and early and favorable action is respectfully solicited.

Respectfully submitted,

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